

REMARKS/ARGUMENTS

Claims 8-11 are pending herein. Claim 8 has been amended as supported by paragraphs [0052] and [0060] of the original specification, for example.

1. Claims 8-11 were rejected under §103(a) over Vaudo in view of Razeghi and Dentai and further in view of Mayeda or Kim. To the extent that this rejection might be applied against amended claim 8 (and all claims depending therefrom), it is respectfully traversed.

Pending independent claim 8 recites, among other things, a double reactor structure that includes an inner reactor surrounded by an outer reactor, with the inner and outer reactors being spaced from one another. Pending claim 8 has been amended to clarify that a space between the inner reactor and the outer reactor is evacuated and maintained in vacuum. The applied prior art of record, discussed below, does not disclose or suggest this claimed feature.

Applicants discovered that leakage of corrosive gases from the inside of the reactor into the surrounding environment can be advantageously prevented if the space between the inner and outer reactors is evacuated and maintained in vacuum (see, e.g., paragraph [0054] and [0057] of the original specification). As such, better prevention of adverse effects associated with the exposure to such corrosive gases results if the space between the inner and outer reactors is evacuated and maintained in vacuum, as claimed.

Vaudo discloses forming an AlN film on a substrate using an HVPE process. The PTO acknowledges on page 3 of the Office Action that Vaudo does not disclose a reactor including an inner reactor and an outer reactor that are spaced from one another.

Razeghi is relied upon in the Office Action only for disclosure of a MOCVD or MOMBE reaction chamber in which all surfaces of a quartz reactor are coated with a barrier coating of AlN or SiC.

Fig. 1 of Dentai shows a reactor structure that includes a fused silica reactor liner 5 positioned within a fused silica reactor 12. An end portion of reactor liner 5 is open and, as such, the space inside the reactor liner (i.e., where susceptor 2 is positioned) is in communication with the area inside of silica reactor 12.

Mayeda discloses a CVD apparatus that includes a plurality of access channels through which a test gas flows into selected gas flow ports without substantial obstruction in order to test the gas flow seals of certain gas flow ports (col. 2, lines 25-40).

Kim discloses a semiconductor device including a gas detector having a plurality of inflow apertures through which a leakage gas is pumped toward the gas detector in order to detect gas leaks in the device (see abstract of Kim).

The PTO's position is apparently that skilled artisans would have been motivated to (1) modify the reactor structure disclosed by Vaudo to include a silica reactor liner (as apparently disclosed by Dentai) that is spaced from Vaudo's reactor, (2) then form an AlN coating on the silica reactor liner in Vaudo's modified reactor structure (as apparently disclosed by Razeghi), and (3) then modify the combination of Vaudo, Dentai and Razeghi to include gas leak detecting means, as is apparently disclosed by either Mayeda or Kim. Notwithstanding the impermissible hindsight analysis that is required to combine the prior art in such a manner, even if the prior art were combined as asserted in the Office Action, there would still be no disclosure or suggestion of a double reactor structure in which a space between an inner reactor and an outer reactor is evacuated and maintained in vacuum, as now recited in pending claim 8.

While Dentai discloses the generic concept of a reaction chamber having a reactor liner, it is clear that the environment inside reactor liner 5 is in communication with the environment inside of silica reactor 12. As discussed above, pending claim 8 has been

amended in order to clarify that the space between the inner and outer reactors is evacuated and maintained in vacuum. If Vaudo's reactor were modified to include Dentai's reactor liner 5, the resultant reactor structure would certainly not include a space between the reactor liner and the reactor that is evacuated and maintained in vacuum. This is especially true since Vaudo is silent with respect to the positioning of a reactor liner inside the reactor and Dentai discloses that the environments inside of reactor liner 5 and reactor 12 are in communication with one another. As such, even if the prior art were combined as asserted in the Office Action, there would still be no disclosure or suggestion of each and every element now recited in pending claim 8. This rejection should be withdrawn for this reason alone.

Moreover, Mayeda and Kim do not disclose gas leak detecting means that detects gas leaks in a space between inner and outer reactors, let alone that such a space should be evacuated and maintained in vacuum, as claimed. For instance, Mayeda discloses only that a CVD apparatus includes a plurality of access channels through which a test gas flows into selected gas flow ports without substantial obstruction in order to test the gas seals of certain gas flow ports (see column 22, lines 25-40). Kim discloses a semiconductor device including a gas detector having a plurality of in flow apertures through which a leakage gas is pumped toward the gas detector in order to detect gas leaks in the device (see the Abstract of Kim). As such, even if the gas detectors of Mayeda and Kim were combined with Vaudo, Dentai and Razhegi as alleged in the Office Action, there would still be no disclosure or suggestion of gas leak detecting means that detects gas leaks in a space between inner and outer reactors, let alone that such a space should be evacuated and maintained in vacuum, as claimed. This is another reason that this rejection is erroneous and should be withdrawn.

In view of all of the foregoing, reconsideration and withdrawal of the §103(a) rejection over Vaudo, Razhegi, Dentai, and Mayeda or Kim are respectfully requested.

2. Claims 8-11 were rejected under §103(a) over Vaudo in view of Razhegi and Yoshida and further in view of Mayeda or Kim. To the extent that this rejection might be applied against amended claim 8 (and all claims depending therefrom), it is respectfully traversed.

Vaudo, Razhegi, Mayeda and Kim are discussed above on pages 4 and 5 of the present amendment. Fig. 1 of Yoshida shows a quartz ampule 11 positioned within a quartz liner 18. Similar to the PTO's position discussed above with respect to the combination of prior art including Dentai, the PTO is apparently arguing that skilled artisans would have been motivated to (1) modify the reactor structure disclosed by Vaudo to include a quartz liner (as apparently disclosed by Yoshida) that is spaced from Vaudo's reactor, (2) then form an AlN coating on the quartz reactor liner in Vaudo's modified reactor structure (as apparently disclosed by Razeghi), and (3) then modify the combination of Vaudo, Yoshida and Razeghi to include gas leak detecting means, as is apparently disclosed by either Mayeda or Kim. Again, notwithstanding the impermissible hindsight reasoning that is required to combine the prior art in such a manner, even if the prior art were combined as asserted in the Office Action, there would still be no disclosure or suggestion of a double reactor structure in which a space between an inner reactor and an outer reactor is evacuated and maintained in vacuum, as now recited in pending claim 8.

Yoshida discloses nothing more than the generic concept of a reaction chamber having a reactor liner. There is no disclosure, however, that the space between quartz ampule 11 and quartz liner tube 18 is or should be evacuated and maintained in vacuum, as recited in pending claim 8. Similar to the combination of Vaudo and Dentai discussed above, if

Vaudo's reactor were modified to include the quartz ampule structure shown in Fig. 1 of Yoshida, the resultant reactor structure would still not include a space between the reactor liner and the reactor that is evacuated and maintained in vacuum, as claimed. This is especially true since Vaudo is silent with respect to the positioning of a reactor liner inside of the reactor and Yoshida does not disclose or suggest that the space between the quartz liner tube and ampule should be maintained in vacuum for any reason, let alone to aid in the detection of gas leaks. As such, even if the prior art were combined as asserted in the Office Action, there would still be no disclosure or suggestion of each and every element now recited in pending claim 8. This rejection should be withdrawn for this reason alone.

Moreover, for the reasons discussed above on page 6 of the present Amendment, Mayeda and Kim do not disclose gas leak detecting means that detects gas leaks in a space between inner and outer reactors, let alone that such a space should be evacuated and maintained in vacuum, as claimed. As such, even if the gas detectors of Mayeda and Kim were combined with Vaudo, Yoshida and Razhegi as alleged in the Office Action, there would still be no disclosure or suggestion of gas leak detecting means that detects gas leaks in a space between inner and outer reactors, let alone that such a space should be evacuated and maintained in vacuum, as claimed. This is another reason that this rejection is erroneous and should be withdrawn.

In view of all of the foregoing, reconsideration and withdrawal of the §103(a) rejection over Vaudo, Razhegi, Yoshida, and Mayeda or Kim are respectfully requested.

3. Claims 8-11 were rejected under §103(a) over Vaudo in view of Razhegi and Nakamura and further in view of Mayeda or Kim. To the extent that this rejection might be applied against amended claim 8 (and all claims depending therefrom), it is respectfully traversed.

Vaudo, Razeghi, Mayeda and Kim are discussed above on pages 4 and 5 of the present Amendment. Fig. 5 of Nakamura shows a reactor vessel 10 including quartz inner and outer tubes. The space defined within the inner tube is in communication with the environment of the outer tube via a monitor window 13.

Similar to the PTO's position discussed above with respect to the other rejections asserted in the Office Action, the PTO is apparently arguing that skilled artisans would have been motivated to (1) modify the reactor structure disclosed by Vaudo to include a quartz liner (as apparently disclosed by Nakamura) that is spaced from Vaudo's reactor, (2) then form an AlN coating on the quartz reactor liner in Vaudo's modified reactor structure (as apparently disclosed by Razeghi), and (3) then modify the combination of Vaudo, Nakamura and Razeghi to include gas leak detecting means, as is apparently disclosed by either Mayeda or Kim. Again, notwithstanding the impermissible hindsight reasoning that is required to combine the prior art in such a manner, even if the prior art were combined as asserted in the Office Action, there would still be no disclosure or suggestion of a double reactor structure in which a space between an inner reactor and an outer reactor is evacuated and maintained in vacuum, as now recited in pending claim 8.

Similar to Dentai (discussed above), while Nakamura discloses the generic concept of a reaction chamber having a reactor liner, it is clear that the environment inside the quartz inner tube is in communication with the environment inside the quartz outer tube (i.e., via monitor window 13). As discussed above, pending claim 8 has been amended in order to clarify that the space between the inner and outer reactors is evacuated and maintained in vacuum. If Vaudo's reactor were modified to include Nakamura's quartz inner tube, the resultant reactor structure would certainly not include a space between the reactor liner and the reactor, with the space being evacuated and maintained in vacuum, as claimed. This is

especially true since Vaudo is silent with respect to the positioning of a reactor liner inside of the reactor and Nakamura discloses that the environments inside of the quartz inner and outer tubes are in communication with one another. As such, even if the prior art were combined as asserted in the Office Action, there would still be no disclosure or suggestion of each and every element now recited in pending claim 8. This rejection should be withdrawn for this reason alone.

Moreover, for the reasons discussed above on page 6 of the present Amendment, Mayeda and Kim do not disclose gas leak detecting means that detects gas leaks in a space between inner and outer reactors, let alone that such a space should be evacuated and maintained in vacuum, as claimed. As such, even if the gas detectors of Mayeda and Kim were combined with Vaudo, Nakamura and Razhegi as alleged in the Office Action, there would still be no disclosure or suggestion of gas leak detecting means that detects gas leaks in a space between inner and outer reactors, let alone that such a space should be evacuated and maintained in vacuum, as claimed. This is another reason that this rejection is erroneous and should be withdrawn.

In view of all of the foregoing, reconsideration and withdrawal of the §103(a) rejection over Vaudo, Razhegi, Nakamura, and Mayeda or Kim are respectfully requested.

If the Examiner believes that contact with Applicant's attorney would be advantageous toward the disposition of this case, the Examiner is herein requested to call Applicant's attorney at the phone number noted below.

The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-1446.

Respectfully submitted,

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Date

Steven W. Caldwell

Steven W. Caldwell

Reg. No. 51,525

SWC:jms

BURR & BROWN
P.O. Box 7068
Syracuse, NY 13261-7068

Customer No.: 025191
Telephone: (315) 233-8300
Facsimile: (315) 233-8320